

## 14.4: Discussion

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### Discussion

Write a minimum one-page (12 font, single spaced) discussion on the experiment conducted this week. Address **at least one question in each category** as fully as possible integrating the collected data, providing explanations for the observed trends, and evaluating whether your original assumptions about the experiment were validated by the results. **The assignment will be graded on completeness, clarity of the explanations and the meaningful integration of the collected and calculated data.** Correct grammar and appropriate format for the chemical formulae and chemical reactions is expected. **You may use the outline included at the end of this document on how to build your essay to address each category.**

1. (Analysis) Describe what happens when vinegar is added to water.
2. (Interpretation) Using your balanced chemical equation that describes the observed reaction of the Alka-Seltzer in water, interpret its meaning on the microscopic and macroscopic scale.
3. (Analysis) Bubbles of CO<sub>2</sub> formed during your reactions. Provide at least one argument for why the CO<sub>2</sub> molecules didn't remain in the solution.
4. (Analysis) Provide an argument in favor of using a scale that reads to the hundredths place for this experiment.
5. (Analysis) Provide a valid reason for waiting until there are no more bubbles produced or present in the solution before recording the final mass of the reaction.
6. (Analysis) Identify which measured and calculated values would change if you stopped the experiment early. Predict if the values would increase or decrease as a result of rushing the experiment.
7. (Interpretation) Using your balanced chemical equation that describes the observed reaction of the Alka-Seltzer with vinegar, interpret its meaning on the microscopic and macroscopic scale.
8. (Analysis) If Alka-Seltzer undergoes a reaction even when dissolved in water, provide a supported argument for using vinegar.
9. (Assumptions) The difference in mass between the starting materials and the reactants is the gaseous carbon dioxide that was produced. Describe at least one assumption that would make this statement valid.
10. (Interpretation) Describe your graph. Identify at what volume of vinegar added did the sodium bicarbonate become the limiting reactant.
11. (Assumptions and limitations) The mass of CO<sub>2</sub> lost between the different cups changes because the amount of vinegar used increased between additions. Describe at least one assumption regarding the limiting reactants that would make this statement valid and one that makes it invalid. Use your graph to support your arguments.
12. (Analysis) Identify the limiting reactant when only water or a small amount of vinegar was used. Provide numerical evidence to support your argument.
13. (Analysis) Identify the limiting reactant when a large amount of vinegar was used. Provide numerical evidence to support your argument.
14. (Analysis) Compare your % NaHCO<sub>3</sub> in an Alka-Seltzer tablet with the manufacturer's data. Comment on the accuracy and precision of the experiment.

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